

ORIGINAL RESEARCH ARTICLE

Adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices: A scoping review

DOI: 10.29063/ajrh2022/v26i2.9

Thelma Fennie^{1*}, Mokgadi Moletsane² and Anita Padmanabhanunni¹

Psychology Department, University of the Western Cape, Cape Town, South Africa¹; Educational Psychology Department, University of the Western Cape, Cape Town, South Africa²

***For Correspondence:** Email: tfennie@uwc.ac.za; Phone: +27 21 959 3095

Abstract

Menstruation is experienced differently among school-going adolescents in various cultures and social contexts. This scoping review summarises the emerging evidence on adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices. A search was conducted via relevant databases and journals for the period 2004 to 2020. Two reviewers independently evaluated the methodological quality of the identified articles. The 35 articles included in the review represented adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices. Narrative analysis revealed that cultural perceptions and beliefs, economic and institutional resources and primary sources of information influenced the experience of menstruation and its management. Menstruation remained shrouded in secrecy and shame for many girls, leading to absenteeism from school. These findings underscore the need to further explore cultural practices and beliefs about menstruation that influence school attendance and long-term educational prospects of adolescent girls. (*Afr J Reprod Health* 2022; 26[2]: 88-105).

Keywords: Menstruation; adolescent girls; psychological effects or psychological impact; experiences; scoping review; gender equality

Résumé

La menstruation est vécue différemment chez les adolescentes scolarisées selon leurs cultures et milieux. Cette étude basée sur les données et les résultats des revues scientifiques de 2004 à 2020 résume les preuves de perceptions et de croyances culturelles des adolescentes concernant la menstruation et les pratiques menstruelles. Deux analyses indépendantes de 35 articles identifiés comme pertinents aux perceptions et croyances culturelles des adolescentes sur la menstruation et les pratiques menstruelles ont révélé que les perceptions, les croyances culturelles, les ressources économiques et institutionnelles ainsi que les sources d'information jouent un rôle prépondérant dans l'expérience et la gestion de la menstruation. Elles ont aussi révélé que pour des nombreuses filles la menstruation reste un sujet tabou et honteux. Ceci explique leurs absences à l'école et en même temps ça justifie la nécessité d'une éducation adéquate et à long terme pour ces adolescentes. (*Afr J Reprod Health* 2022; 26[2]: 88-105).

Mots-clés: Menstruations ; adolescentes; effets psychologiques ou impact psychologique; expériences; une analyse exploratoire; égalité des sexes

Introduction

Although menstruation is a universal experience for girls, in most rural and urban parts of South and Sub-Saharan Africa (SSA), adolescent girls experience severe challenges with it^{1, 2, 3}. The onset of a girl's first period (i.e. menarche) forms an important milestone and is experienced as a passage from childhood to womanhood, through which the young person acquires a new status in the family. The aim of this study is to explore the experiences of adolescent girls regarding menarche and menstruation. A scoping review was used to

summarise and critically evaluate current empirical evidence on girls' perceptions and cultural beliefs about menstruation and menstrual practices. This review has the potential to provide guidelines on ways to address the psychosocial challenges experienced by girls due to menstruation and its management⁴. Limited research literature exists on how adolescent girls make meaning of menarche and menstruation in developing contexts. A study of this nature will provide a frame of reference for the development of menstrual hygiene management interventions and improve psychological health and wellbeing of girls within the school environment.

Rationale for the study

Many adolescent girls live in low- and middle-income communities and face challenges with regard to menstruation, which impact on their physical and psychological wellbeing⁵. It is critical to understand the nature of adolescent girls' experiences with menstruation, particularly in relation to culture, in order to enhance existing education policies and programmes, particularly in developing contexts. Limited qualitative research has been done on this topic in low to middle-income countries⁶. Thus, this study will address this gap in the available literature.

Aim

The aim of the review was to summarise and critically evaluate empirical evidence on adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices.

Objectives

1. To investigate the current knowledge on girls' experiences of menstruation through a scoping review.
2. To understand the impact of menstrual practices and the implications for girls' psychological wellbeing.
3. To understand the knowledge and practices of adolescent schoolgirls regarding menstruation.
4. To explore whether there are differences in the experiences of menstruation among adolescent schoolgirls across socio-economic classes.

Methods

Research questions

Five questions were derived from the objectives of this study, which assisted in the framing and focus of the study. The main research question was:

What is the empirical evidence regarding adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices?

In order to address the main research question, the following sub-questions were asked:

1. What are the current knowledge, perceptions, and cultural and religious beliefs around menstruation and the menstrual practices of school-going adolescent girls?

Perceptions and beliefs regarding menstruation

2. What is the impact of menstrual practices and what are the implications for the psychological wellbeing of school-going adolescent girls?
3. What knowledge and practices are common among adolescent schoolgirls with regard to menstruation?
4. What are the similarities and/or differences in the experiences of adolescent schoolgirls across socio-economic classes?

Research design

A scoping review can be defined as the mapping of key concepts, main sources and evidence which forms the basis of a research area⁷. A scoping review was deemed appropriate for this review as this approach allows the reviewer to identify all available evidence on a given topic. Scoping reviews are particularly valuable as it allows for the mapping of key concepts that underpin a research area⁷.

Search strategy for the identification of studies

The following electronic databases were used: EbscoHost, Science Direct, SCOPUS, JSTOR, SABINET, SAGE JOURNALS ONLINE, CINAHL Plus, MEDLINE and Google Scholar. The following keyword were used: adolescent girls', 'menstruation', 'hygiene', 'perceptions, opinions, experiences and cultural beliefs.' These search terms were used interchangeably in different combinations using the Boolean operators 'and' and/or 'or.' The inclusion criteria included articles were in English, published between January 2004 and December 2020. The exclusion criteria included age groups other than adolescence, articles published before 2004, that were not in the English language and not peer-reviewed. The PRISMA flowchart⁷ (see figure 1) was used to reflect the selection and elimination processes. The initial search resulted in 164 articles. Once the duplicates were removed, 55 articles were screened and 17 articles were excluded. Thirty-eight articles were eligible for full-text reading and 35 final articles were included in this review (see Table 3).

Data analysis

Narrative analysis was used for this study. It is an appropriate analysis technique to use to understand

Table 1: Geographical distribution of studies

Location of studies in alphabetic order	Total
China	1
Egypt	1
Ethiopia	3
India	9
Jordan	1
Kenya	2
Malaysia	1
Mexico	2
Nepal	2
Nigeria	2
South Africa	1
Taiwan	1
Uganda	1
Ghana	1
Bangladesh	2
Pakistan	2
Indonesia	2
Côte D'Ivoire	1
Total	35

Table 2: Study designs of the included studies

Research design	Number of studies
Quantitative	26
Cross-sectional	16
School-based cross-sectional	2
Descriptive cross-sectional	1
Institutional based cross-sectional	1
Community-based cross-sectional	2
Cross-sectional survey	4
Quantitative descriptive	1
Cross-sectional mixed methods	1
Qualitative	8
Qualitative design	7
Ethnography	1
Mixed method	1
Total	35

human experiences and study the meanings that people give to life experiences^{8, 48}.

Geographical distribution and study design

Table 1 provides the geographic distribution of studies. More than a quarter of the studies emerged from India. As may be seen in Table 2, as well as in the adapted PRISMA flowchart⁹ in Figure 1w, the majority of the studies (26) included in the scoping review were quantitative in nature, while (8) were qualitative and (1) was mixed method in nature. The quantitative studies included 26 cross-sectional designs, 8 qualitative studies included seven qualitative and one ethnographic study design and one mixed method.

Results

A total of 35 studies were included in the review (See Table 3). Four themes emerged from the narrative analysis: cultural perceptions, menstrual practices and hygiene, resources and sources of information.

Cultural perceptions

Perceptions and beliefs

All articles in this scoping review concurred that cultural myths, misconceptions and inadequate knowledge of menstruation negatively influenced the experiences of girls. In a study in Western Kenya, menstruation was understood as being a sign of fertility, and girls were told that sex should be avoided^{10-11, 13, 16}. Myths and misinformation regarding menstruation were also expressed by boys who used menstruation as the subject of teasing or bullying⁴⁴. Menstruating girls were often isolated by their families and treated differently because menstruation was considered shameful and taboo, which enhanced girls their negative view of menstruation^{14-16,37}. Girls were prohibited from worshipping, cooking and undertaking certain household chores^{18, 36, 40}. These evoked feelings such as shame, fear, anxiety and depression were common¹².

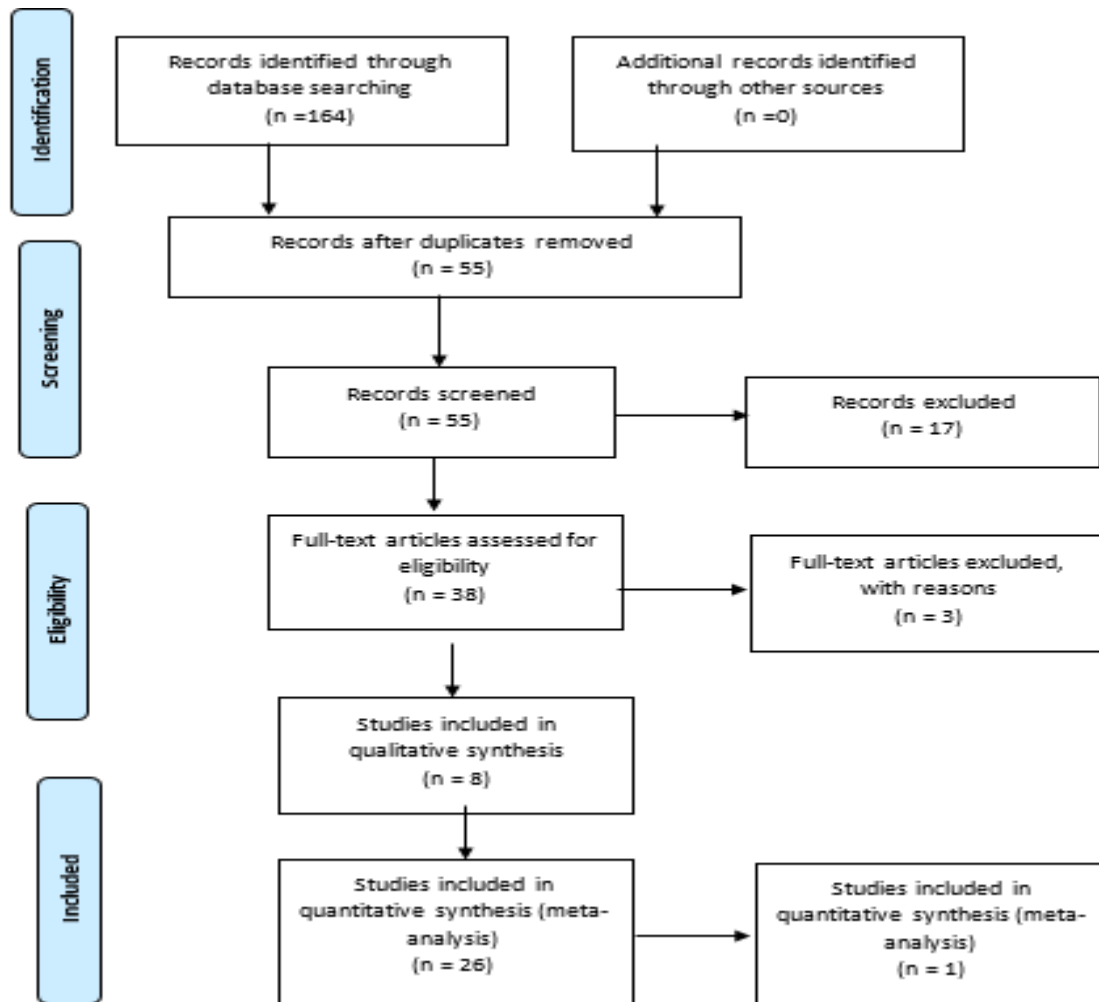
Studies in Kenya, Bangladesh and Côte D'Ivoire found that adolescent girls reported stigma, shame and fear in relation menstruation^{14-16, 42, 45, 47}. These experiences were transformed in contexts where significant socio-economic advancement had taken place. This was the case in Taiwan where social changes resulted in greater openness about previously held taboo topics such as menstruation¹⁵.

Menstrual experiences

In many contexts, negative appraisals of menstruation lead to avoidant behaviour among girls including absenteeism from school. Absenteeism was also found to be related to menstrual hygiene management^{35, 47}. In Bangladesh, 42% of girls missed school during menstruation³⁶. Studies in India and Bangladesh, found absenteeism was higher among rural girls^{17,36,37} due to restrictions imposed by elders in rural communities or due to adolescent girls' fears



PRISMA 2009 Flow Diagram



(adapted from) Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G. (2009). The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. <https://doi.org/10.1371/journal.pmed.1000097>.

Figure 1: PRISMA flow diagram of search

around menstrual leakage and negative attitudes towards menstruation^{18, 21,36,37,39}.

A study in Nepal highlighted the practice of *Chhapaudi*, a form of exile where menstruating girls are restricted from consuming dairy products and attending community activities¹⁹. Those who do not prescribe to the practice are viewed as bringing bad luck to their family^{20,21,34}. Menstruating women are restricted to living in

unsanitary livestock sheds for the duration of their menstrual period.

Instead of menarche being viewed as a 'rite of passage' into womanhood, ignorance and mismanagement leads to shame and risks of sexual harm²², once girls have their first period they are viewed as sexually mature²². This places girls in a vulnerable and dangerous position as they are then faced with sexual advances and the risk of being

violated. Many girls adopt secretive attitudes and behaviours when they reach menarche. They become afraid that boys and older males may find out and use concealment as a defence mechanism^{23, 35}. Open discussions and dialogue among cultures concerning menstruation should be encouraged and not prohibited; as such, discussions could lead to the dismantling of erroneous perceptions and beliefs and the dissemination of new knowledge and awareness.

Menstrual practices and hygiene

Sanitation, water and hygiene are the most unrecognised factors influencing the reproductive health of women^{16, 28, 35}. One study reported that 38, 6% of the adolescent girls in the sample were classified as having poor menstrual hygiene management³⁵. In another study, participants said that they were forced to use alternatives to menstrual pads such as pieces of clothing, cloths and mattress fibres, because old clothes are cheap and can be reused^{10, 24-27, 33}. Poor hygiene and unsafe sanitary conditions resulted in gynaecological problems for girls^{16, 27, 29, 30, 45}. Adolescent girls who receive pocket money from their families were three times more likely to practice good menstrual hygiene^{18, 24, 24}. Taiwanese women were found to avoid cold water, exercise and raw food^{15, 39} as a way of maintaining menstrual health¹⁵.

The resources and facilities at schools further influence the menstrual hygiene management and school attendance of girls^{25, 35, 45-47}. Studies found that only two schools included in the study had water supply, while none of the schools had soap and only three schools had bins for the disposal of sanitary materials^{35, 39}. A study conducted in Côte D'Ivoire found that 87% of girls felt that the school environment was an unhealthy space. A similar study found that 82% of school facilities in Bangladesh were deemed unhygienic and the lack of gender-separated adequate toilets negatively influenced menstrual hygiene management and increased absenteeism^{36, 42}. The low use of sanitary pads and poor hygiene shown by rural girls in their study could be ascribed to low socioeconomic status, a lack of knowledge and the unavailability of sanitary materials^{19, 22, 29-33, 37}.

Resources

The resources available to menstruating adolescent girls determine the practices they follow and the

materials they use while menstruating. Sanitary pads and tampons are considered safe and sanitary materials. However, many women and girls in developing and poor countries cannot afford pads and tampons, and are forced to use unsanitary materials such as old cloths, napkins or tissue paper. Girls from urban areas are more likely to be exposed to better healthcare and better information via the media that might assist them in gaining access to safer sanitary materials. In addition, their financial circumstances and socioeconomic conditions are likely to be better than those of girls from rural areas and poorer backgrounds.

Economic and institutional resources

There is a marked interplay between socioeconomic status and menstrual hygiene practices^{16, 34-35, 40}. This is due to financial status influencing knowledge and monetary support that adolescent girls receive during menstruation³⁵. Resources need to be available to women to ensure their reproductive health. A study¹⁶ found that 44.1% of the population used sanitary pads, while 21.2% used both cloths and sanitary pads¹⁶. Another study reported that 86% of girls used cloth during menstruation, while another study found that 98% of adolescent girls were used pieces of cloth as pads^{34, 36, 38}. The relatively high number for the use of pads may be ascribed to the particular area where the study was conducted. Furthermore, in the area studied, girls were exposed to various media including television, which increased their awareness regarding the availability and use of sanitary pads. A study in Kenya where pads cost \$1 per pack, found that this price was high in comparison with the earnings of a single household, and as a result many girls had to improvise and resorted to using inadequate methods to protect themselves²². Another study conducted in Kenya also reported that 39,1% of girls received absorbents from their school⁴². Inadequate sanitary produces exposed girls to harm^{22, 37}.

More than half of the schoolgirls from urban areas used sanitary pads compared to 29% from rural areas^{29, 38, 39, 40}. Approximately 64,7% of girls with poor menstrual hygiene management reused menstrual material³⁶. It was also found that 93, 5% of the girls were reusing cloths after washing it with soap and water, and similar studies found that 64% of girls washed their cloths with soap^{25, 36, 37}. A study in Bangladesh found that 85%

Table 3: Data reflecting findings from 35 studies used in the scoping review

Citation	Authors	Type of design	Setting	Study population	Methodology/ Instrument	Comments/ outcomes assessed
46.	Andani PR. 2020.	Cross-sectional design	Indonesia	78 students aged 10 to 13 years old.	Questionnaire	The majority of the participants had good knowledge, attitude and practice regarding menstrual hygiene. Nevertheless, the knowledge, attitude, and practice of all the participants still need to improve. The school along with the parents and health provider are expected to reinforce the health education program about menstrual hygiene management.
44.	Gold-Watts A, Hovdenak M, Danie, M, Gandhimathi S, Sudha R and Bastien S. 2020.	Qualitative design	India	10 adolescent girls in ninth grade	Semi-structured interviews	Findings revealed that menarche inaugurates biological transitions of puberty and cultural codes that shape gender norms. Gender norms in turn generate, maintain, and reproduce stigmatizing attitudes, beliefs, and practices that influenced the development of coping mechanisms at home and at school. Resulting adaptations to the intervention consisted of two activities (school lesson and an extracurricular activity) that address knowledge gaps and myths. This study demonstrates the importance of qualitative research in unpacking adolescent girls' experiences with menarche and menstruation. Study findings also show how formative research can contribute to the adaptation and development of a contextually and culturally-relevant water, sanitation, and hygiene intervention.
45.	Hennegan J and Sol L. 2020.	Cross-sectional design	Bangladesh	1359 schoolgirls aged 10 to 16 years old	Survey	Confidence to manage menstruation at home, while other menstrual hygiene practices were unrelated. Features of sanitation facilities such as cleanliness and the presence of a bin were associated with increased confidence at home. At school, supportive policies, such providing permission to use the toilet when needed, were associated with greater confidence. Talking to a friend about menstruation was positively associated with confidence at school, while at home having discussed menstruation with parents predicted lower confidence. Findings provide quantitative support for the role of multiple independent predictors in girls' confidence to manage menstruation highlighted by qualitative studies.
33.	Kemigisha E, Rai M, Mlahagwa, Nyakato VN and Ivanova O. 2020.	Qualitative research design	Uganda	28 adolescent girls aged 11 to 19 years old.	Interviews and focus group discussions	The main findings of the study included (a) challenging social contexts with negative experiences during migration, family separation and scarcity of resources for livelihood within the settlement, (b) unfavorable menstruation experiences and a lack of knowledge, menstrual practices that included unsuitable substitutes for MHM and poor health-seeking behaviour.

						Comprehensive sexual education, enhancement of parent-adolescent communication and support from NGOs is needed to assist adolescent girls.
35.	Kumbeni MT, Otupiri E and Ziba A. 2020.	Cross-sectional design	Ghana	730 junior high school adolescent girls aged 10 to 19 years old.	Structured questionnaire and checklist	The level of menstrual hygiene among in-school adolescent girls in northern Ghana is described as average. Although most of the schools had toilet facilities, they lacked clean water, soap, privacy and dustbins, which are necessary for menstrual hygiene management. Interventions should target improving water, sanitation, and hygiene facilities in schools as well as supply of pads to girls in rural school.
41.	Michael J, Iqbal Q, Haider S, Khalid A, Haque N, Ishaq R, Saleem F, Hassali MA and Bashaar M. 2020.	Cross-sectional design	Pakistan	123 female adolescents aged 12 to 18 years old.	Survey	Mothers were found to be the main source of information regarding menstruation. Absorbent material was used by the majority of the population, and sanitary pads/napkins were also used. The majority of the participants did not take baths during menstruation, but most of them cleaned their genitalia with water during menstruation. Female adolescents of the study had certain misconception regarding menstruation because of poor access to health-related education. Education can be provided at healthcare facilities, residential area as well as religious centers. Adolescent reproductive health should be included in the school curriculum; this will influence general reproductive health of females.
30.	Belayneh Z and Mekuriaw B. 2019.	Institutional based cross-sectional design (quantitative).	Ethiopia	791 randomly selected high school adolescent girls.	Interviewer administered questionnaire	Majority of adolescent schoolgirls had poor knowledge regarding menstruation and their hygienic practices are incorrect. Lower age, longer duration of menses flow and poor knowledge towards menstruation were significant correlates of poor hygienic practice. This demonstrates a need to design acceptable awareness creation and advocacy programs for adolescent schoolgirls and the public to improve the knowledge and safe hygienic practice of their menstruation flow.
31.	Borjugen A, Huang C, Liu M, Lu J, Peng H, Sapkota C and Sheng J. 2019.	Cross-sectional design (quantitative).	China	1,349 adolescent girls aged 11 to 14 years old.	Self-administered questionnaires.	The level of menstruation knowledge, attitudes and practices (KAP) is part of the cause of psychological stress in adolescent girls, or psychological stress levels might be the limiting factor in adolescent girls' level of menstrual KAP, or both. Based on this study, schools, teachers, professionals, and family members should not only pay attention to the physical changes that children undergo during adolescence, but also to stress management methods that can help adolescents cope more effectively. Unlike adults and children, adolescent girls have special challenges and needs that should be addressed in a unique way. Therefore, a further study should be conducted to determine the causal relationship between menstrual KAP and psychological stress.

47.	Guehi EZ and Secredou KM. 2019.	Mixed method design	Côte D'Ivoire	672 menstruated girls in junior and high schools	Life stories, individual interviews, focus groups.	The school environment does not allow girls well-off during menstruation. Constraints and challenges have implications for school attendance and girls' performance during this period. Future research perspectives must take into account the social and regional disparities between the students, and also direct their observations towards junior and senior girls' high schools and top schools. There is a need to establish policies, and to encourage practical and programmatic innovations in girls' education.
21.	Rastogi S, Khanna A and Mathur P. 2019.	Cross-sectional design (quantitative)	India	187 adolescent girls between 13 and 15 years old.	Pre-tested questionnaire	Strengthening the immediate environment of girls including their family (including male members like fathers, brothers etc.), peers, school staff and community to act as support groups is imperative. Educating mothers about menstrual hygiene and encouraging them to adopt healthy menstrual practices at home can help in the achievement of healthful behaviour by adolescent girls. The school curriculum needs to be modified to impart appropriate menstrual knowledge in an engaging manner for it to be understood and adopted into daily practice. The focus of interventions should shift from dissemination of knowledge to changing attitudes and practices. Research suggests that strategic behaviour change interventions to influence knowledge, attitude and practices should be designed involving all stakeholders to ensure a sustained move towards positive health of adolescent girls.
25.	Choudhary N and Gupta KM. 2019.	Cross-sectional design (quantitative).	India	450 adolescent schoolgirls in grade 8 to 12	Self-administered questionnaire. 60 mins was given for the questionnaires to be completed.	Significant differences were observed among urban and rural adolescent girls in terms of knowledge, perception, and practices related to menstrual hygiene. Ignorance, false perceptions, and unhygienic practices were also prevailing among adolescent girls. There is also an urgent need for health promotion interventions in the form of regular awareness sessions and counseling for menstrual hygiene management at primary care level.
20.	Amatya P, Ghimire S, Callahan KE, Baral BK and Poudel KC. 2018.	Cross-sectional mixed-methods design (quantitative)	Nepal	107 adolescent girls aged 12 to 19 years.	Self-administered survey, 13-item observation checklist and a focus group discussion.	<i>Chhaupadi</i> has been condemned by human rights organizations. While the government has banned the practice, implementation on the ban is proceeding slowly, especially in far-western Nepal. Thus, as a temporary measure, public health professionals must work towards promoting the health and safety of Nepalese women and girls still practicing <i>Chhaupadi</i> .
37.	Davis J, Macintyre A, Odagiri M, Suriastini W, Cordova A, Huggett C, Agius PA, Faiqoh F, Budiyan, AE, Quillet C, Cronin AA, Diah NM,	Cross-sectional design	Indonesia	1159 adolescent girls aged 12-19 years old.	Semi-structured, self-administered questionnaire	High prevalence of poor MHM and considerable school absenteeism due to menstruation among Indonesian girls highlight the need for improved interventions that reach girls at a young age and address knowledge, shame and secrecy, acceptability of WASH infrastructure and menstrual pain management. high population prevalence of poor MHM among Indonesian adolescent girls, and strong association between poor MHM

	Triwahyunto A, Luchters S and Kennedy E. 2018.					and low knowledge, highlight the need for comprehensive education interventions in school settings, delivered during early adolescence to reach pre-menarcheal girls, particularly in rural settings.
19.	Deshpande TN, Patil SS, Gharai SB, Patil SR and Durgawale PM. 2018.	Community based cross-sectional design (quantitative).	India	100 adolescent girls between 10 and 19 years old	Pre-designed, pretested questionnaire	This study revealed that menstrual hygiene was unsatisfactory among adolescent girls. This was because of low level of education and improper assumptions about the phenomenon of menstruation. Hence, it is very crucial to educate girls about the physiological facts of menstruation, wipe off false taboos and lead them to proper hygienic practices to safeguard themselves against reproductive tract infections. Various schools, Anganwadi health centers, social welfare foundations, and nongovernment organisations should stand to disseminate awareness about menstrual hygiene, patterns and problems.
42.	Korir E, Okwara FN and Okumbe G. 2018.	Cross-sectional design	Kenya	320 primary school girls	Survey	One third of pubescent schoolgirls from the pastoralist community in Kajiado County, Kenya have sub-optimal MHM practices. The main contributors of this are lack of latrine privacy and fear of teasing by boys. It is recommended investment in provision of private WASH facilities that are culturally acceptable and need to promote sexuality education on menstruation targeting both girls and boys.
36.	Alam M, Luby SP, Halder AK, Islam K, Opel A, Shoab AK, Ghosh PK, Rahman M, Mahon T and Unicomb L. 2017.	Cross-sectional design	Bangladesh	2332 schoolgirls between 11 and 17 years old.	Survey administered verbally and electronically	Risk factors for school absence included girl's attitude, misconceptions about menstruation, insufficient and inadequate facilities at school, and family restriction. Enabling girls to manage menstruation at school by providing knowledge and management methods prior to menarche, privacy and a positive social environment around menstrual issues has the potential to benefit students by reducing school absence.
10.	Secor-Turner M, Schmitz K and Benson K. 2016.	Qualitative research design	Kenya	Twenty-nine girls aged 13–21 years	Individual interviews and field observations. The duration of the interviews ranged from 5 to 20 minutes (average about 15 minutes).	Menstrual hygiene management and its associated challenges may impact girls' academic careers. Experiences of menstruation reinforce gender stereotypes. Consideration of menstruation is critical to promote health and academic continuity for girls in rural Kenya.
18.	Behera D, Sivakami M and Behera MR. 2015.	Qualitative investigation	India	32 adolescent girls within 14–15 years age group.	Focus group discussions were held, each ranging from about 30–40 minutes.	Girls without menarche lacked adequate knowledge about menstruation and its processes. Mothers were found to be playing a limited role regarding menstruation information. Some of the girls were using sanitary pads, while most used old cloths. Financial concerns and difficulties in obtaining sanitary pads were major obstructions for their use. Lack of awareness and appropriate care for menstrual morbidities were reported among these girls, which impacted their educational attainment.
28.	Ramathuba D U. 2015.	Quantitative descriptive design	South Africa	273 secondary school girls in grades 10 to 12.	Self-administered questionnaire.	Most adolescents lack scientific knowledge about menstruation and puberty. Parents often are reluctant to discuss this topic with their adolescent girls. Socio-cultural beliefs that accompany menarche and

						hygienic practices greatly impact negatively at the health of adolescents, and it is from this perspective that reproductive health education campaigns target puberty education so that young women may start adopting healthy lifestyles and develop adequate skills for sexual and reproductive health in future so as to achieve the millennium development goal of improving and reducing maternal mortality.
24.	Upashe SP, Tekelab T, and Mekonnen J. 2015.	School based cross-sectional design (quantitative).	Ethiopia	828 female high school students in grades 9 and 10.	Pre-tested structured questionnaire	The findings showed that the knowledge and practice of menstrual hygiene is low. Awareness regarding the need for information about good menstrual practices is very important. So, health education program should be setup to create awareness and practice of good menstrual hygiene.
29.	Chothe V, Khubchandani J, Seabert D, Asalkar M, Rakshe S, Firke A, Midha I. and Simmons R. 2014.	Qualitative research ethnographic design	India	381 girls participated by asking specific questions about menstruation 9 to 13-year-old students in Grades 6, 7, and 8 were identified for this project.	The questions asked were arranged into the following subthemes: anatomy and physiology, menstrual symptoms, menstrual myths and taboos, health and beauty, menstrual abnormalities, seeking medical advice and home remedies; sanitary pad usage and disposal; diet and lifestyle; and sex education.	Results indicate that students had substantial doubts about menstruation and were influenced by societal myths and taboos in relation to menstrual practices. Parents, adolescent care providers, and policy makers in developing countries should advocate for sexuality education and resources. Findings support previous studies that adolescent girls in low- and middle-income countries may silently suffer some degree of pain, cramping, and discomfort associated with dysmenorrhea.
11.	Gultie T, Hailu D and Workineh Y. 2014.	School based cross-sectional design (quantitative).	Ethiopia	492 female high school students in grades 9, 10, 11 and 12.	Structured self-administered questionnaire	Knowledge of respondents about menstrual hygiene management was very high. School teachers were the primary source of information. Place of residence and their mother's educational status were independent predictors of menstrual hygiene management. Thus, the government of Ethiopia in collaboration with its stalk holders should develop and disseminate reproductive health programmes on menstrual hygiene management targeting both parents and their adolescents. Moreover, parents should be made aware about the need to support their children with appropriate sanitary materials.
23.	Marván M L, and Alcalá-Herrera V. 2014.	Cross-sectional survey (quantitative)	Mexico	Sample of female adolescents attending ten different public schools.	Participants answered one questionnaire about menarcheal experience and another about attitudes towards menstruation.	Early maturers were more likely to state they had not known what they should do at the moment they got their first period, that they had not felt prepared to start menstruating, and that they thought they must keep secret the fact of having had their first period. Concerning their emotional reactions to menarche, early maturers were the most likely to have felt scared, worried, and sad and were the least likely to have felt calm.

40.	Paria B, Bhattacharyya A and Das S. 2014.	Cross-sectional design	India	541 adolescent schoolgirls aged 13 to 18 years old.	Pre-designed and pretested questionnaire	They were also the most likely to show current secretive attitudes towards menstruation. Finally, late maturers showed more positive attitudes toward menstruation than their peers. The difference in the awareness regarding menstruation in urban and rural area was highly significant and only a third of the girls were aware of menstruation prior to the attainment of menarche. This study found differences in hygienic practices followed by adolescent girls in urban and rural area. Conclusion: Hygienic practices during menstruation were unsatisfactory in the rural area as compared to the urban area. Girls should be educated about the proper hygienic practices as well as bring them out of traditional beliefs, misconceptions, and restrictions regarding menstruation.
22.	Mason L, Nyothach E, Alexander K, Odhiambo FO, Eleveld A, Vulule J, Rheingans R, Laserson KF, Mohammed A and Phillips-Howard PA. 2013.	Qualitative design	Kenya	120 girls aged 14-16 years.	The data gathered were supplemented by information from six focus group discussions.	Emergent themes were lack of preparation for menarche; maturation and sexual vulnerability; menstruation as an illness; secrecy, fear and shame of leaking; coping with inadequate alternatives; paying for pads with sex; and problems with menstrual hygiene. Girls were unprepared and demonstrated poor reproductive knowledge, but devised practical methods to cope with menstrual difficulties, often alone. Parental and school support of menstrual needs was limited, and information sparse or inaccurate. Girls admitted 'others' rather than themselves were absent from school during menstruation, due to physical symptoms or inadequate sanitary protection. They described difficulties engaging in class, due to fear of smelling and leakage, and subsequent teasing. Sanitary pads were valued but resource and time constraints result in prolonged use, causing chafing.
32.	Jarrah SS, and Kamel AA. 2012.	Descriptive cross-sectional design (quantitative)	Jordan	490 school-aged girls between 12 and 18 years old	Two questionnaires were administered	It was found that menstrual attitude and practices were positively correlated. Poor attitude toward menstruation and low menstrual practices were significantly associated with inadequate premenstrual preparation. There is a need to prepare girls for menstruation before menarche. The role of the schools and teachers should be reinforced through formal and well planned reproductive health educators for girls and their mothers.
15.	Liu H-L, Chen K-H, Peng N-H. 2012.	Qualitative design	Taiwan	48 adolescent girls participated.	The qualitative interviews varied in length from 20 to 30 min. An open conversation was adopted, following an unstructured flexible approach through face-to-face discussion.	Age at menarche ranged from 9-14 years, with a mean age of 11.67 years (SD 5 0.87). Physiological symptoms, knowledge regarding menstruation, preparedness for menarche, first information providers, the quality of information provided, and emotional reactions to menarche played important roles in menarche and menstruation.

12.	Marván ML and Molina-Abolnik M. 2012.	Cross-sectional survey (quantitative)	Mexico	405 postmenarcheal adolescents, aged 12-15 years	The entire interview was audiotaped and transcribed verbatim. Data were collected using two surveys.	Although most of the participants knew what they should do when they experienced their menarche, only 39% stated they had felt prepared to start menstruating. Regarding menstrual attitudes, adolescents scored higher on 'negative feelings' and 'secrecy' than on 'positive feelings'. Participants who had previously discussed the emotional aspects of menses with their mothers were more likely to claim they had felt prepared to start menstruating when they got their first period. The fact that some adolescents felt prepared to start menstruating predicted their positive attitudes toward menstruation.
16.	Shanbhag D, Shilpa R, D'Souza N, Josephine P, Singh J and Goud BR. 2012.	Qualitative design	India	506 high school girls between the ages of 12 and 16 years.	A pre-designed, pre-tested and structured questionnaire was administered.	99.6% of the students had heard of menstruation and 57.9% had acquired this knowledge before attaining menarche. 73.7% knew that menstruation was a normal phenomenon but only 28.7% had knowledge regarding menstruation. 48.1% did not know that menstruation was related to pregnancy. Only 44.1% used sanitary pads during the menstrual cycles. Among those who used cloth, only 31.3% used soap and water to clean them. 56.8% used soap and water to clean their genital organs and 88.8% of the girls took a bath daily during menstruation.
17.	Thakre SB, Thakre SS, Ughade S and Thakre AD. 2012.	A community based cross-sectional study (quantitative)	India	387 adolescent girls, eighth and ninth standards, >15 and <15 years.	A pre-designed, pre-tested and structured schedule was used for data collection. Data collection was done through personal interviews of study subjects by a single female investigator.	Menstrual practices were significantly better among urban girls than among rural girls. The majority of the girls had at least one problem related to menstrual cycles. Menstrual problems are a common source of morbidity in this population. The age of menarche and absence of urban-rural difference in it are consistent with the findings of other researchers. Differences are pertinent in the number of urban girls who use pads versus rural girls. In the rural girls, low use of sanitary pads and unsatisfactory cleaning of genitalia could be due to low socio-economic status of family, lack of knowledge about menstrual hygiene, unavailability of sanitary napkin and lack of privacy. Higher level of literacy status of mother, low influence of cultural factors, and more knowledge about menstruation has contributed to the reporting of menstrual-related problems in urban girls.
13.	Wong LP. 2011.	Cross-sectional survey design (quantitative)	Malaysia	1,295 rural adolescent girls between the ages of 13 and 19 years.	Semi-structured questionnaire.	The findings imply the need for education to help adolescent girls manage menstrual symptoms and increase awareness of the benefit of treating them. Given that menstrual-related information was widely available from mothers, family, and social culture are potentially important in shaping good menstrual attitudes.

43.	Ali TS and Rizvi SN. 2010.	Cross-sectional design	Pakistan	1275 adolescent girls aged 13 to 19 years old.	Pre-code questionnaire, focus group discussions and in-depth interviews.	Descriptive findings showed that half of the girls lacked an understanding of the origin of menstrual blood and those with a prior knowledge of menarche had gained it primarily through conversations with their mothers. Many reported being afraid at the first experience of bleeding. Almost half of the participants reported that they did not take baths during menstruation. Factors of using unhygienic material, using washcloths, and not drying under sun were found to be significant among those going and not going to schools. This study concludes that there are unhygienic practices and misconceptions among girls requiring action by health care professionals.
27.	Umar ML, Yusuf NW and Musa AB. 2010.	Cross-sectional design (quantitative)	Nigeria	400 adolescent female secondary school students aged 10 to 19 years.	Pretested self-administered questionnaire.	Majority had fair knowledge of menstruation, although deficient in specific knowledge areas. Most of them used sanitary pads as absorbent during their last menses; changed menstrual dressings about 1-5 times per day; and three-quarter increased the frequency of bathing. Institutionalizing sexuality education in Nigerian schools; developing and disseminating sensitive adolescent reproductive health messages targeted at both parents and their adolescent children; and improving access of the adolescents to youth friendly services are veritable means of meeting the adolescent reproductive health needs in Nigeria.
34.	Adhikari P, Kadel B, Dhungel SI and Mandal, A. 2007.	Quantitative design	Nepal	150 adolescent girls aged 13 to 15 years old	questionnaire	Although knowledge was better than practice, both were not satisfactory. So, the girls should be educated about the process and significance of menstruation, use of proper pads or absorbents and its proper disposal. This can be achieved by giving them proper training and health education (by teachers, family members, health educators, and media) so that there won't be any misconception to the adolescent girls regarding menstrual hygiene.
26.	El-Gilany AH, Badawi K and El-Fedawy S. 2005.	Cross-sectional survey (quantitative).	Egypt	464 schoolgirls aged 14 to 18 years	Anonymous self-administered, open-ended questionnaire.	The significant predictors of use of sanitary pads were availability of mass media at home, high and middle social class and urban residence. Use of sanitary pads may be increasing, but not among girls from rural and poor families, and other aspects of personal hygiene were generally found to be poor, such as not changing pads regularly or at night, and not bathing during menstruation. Lack of privacy was an important problem. Mass media were the main source of information about menstrual hygiene, followed by mothers, but a large majority of girls said they needed more information. Instruction in menstrual hygiene should be linked to an expanded programme of health education in schools. A supportive environment for menstrual hygiene has to be provided both at home and in school and sanitary pads made more affordable.

girls used soap every time when washing sanitary materials⁴⁵. Additionally, 20% of the girls were aware of subsidies on sanitary pads that were being provided at government facilities. This shows the impact that financial factors and socioeconomic status can have on an adolescent girl's access to resources to manage menstruation^{35,40,42}. A study found that adolescent girls used re-usable pieces of cloth or any old cloth because they could not afford to buy pads²⁶. A similar study found that 19% of the participants used old cloths and 70% reused these cloths after usage¹⁹. Another study found that 55% of the adolescent girls used cloths during menstruation and an additional 2% used newspaper and handtowels because they could not afford to pay for sanitary pads²⁸.

A study found that illiteracy and poverty were the causes of sociocultural beliefs and taboos in relation to menstruation^{32,40,41,42}. In the absence of fact-based information, communities and cultural groups tend to create their own beliefs and practices, some of which can lead to ill health and unsafe practices among menstruating girls and women.

It seems evident that the resources that adolescent girls have at their disposal directly affect the sanitary materials they use and the practices they follow during their menstrual period. Girls who come from disadvantaged backgrounds are more likely to lack access to adequate resources, including running water, and as a result have to compromise and resort to unsanitary alternatives, as seen in the review above. It is therefore imperative that resources be made available to menstruating adolescent girls, as they form part of a vulnerable group and need to be properly guided for their subsequent menstruation and for their continued progress in schools.

Sources of information

Sources of information are crucial for adolescent girls, since correct information plays a vital role in determining how girls experience and manage their first menstrual period and their periods from then on. Many girls in the included articles had little or no prior knowledge of menstruation prior to menarche. A Bengal study found differences in awareness of menstruation between girls in urban areas versus rural areas⁴⁰. About 98% of the girls in the study felt that incorrect information was taught

to them³⁴. Most girls did not have access to adequate and accurate information regarding menstruation and its practices because of taboos and myths surrounding menstruation^{33,34}. Girls who do not have prior knowledge of menstruation have a more negative reaction to it and are more likely to practice incorrect menstrual hygiene^{13,30,33,34,43,45}.

Girls base their attitudes to menstruation on three sources of information: direct instruction, prevailing beliefs and attitudes, and prevailing misinformation or myths¹⁰. The information received at school tends to focus only on the physiological and biological aspects of menstruation and is thus very impersonal. A study conducted in Nepal found that 6% of girls were actually aware that menstruation is a physiologic process³⁴. Teachers often consider these issues too sensitive to talk about and often feel that girls are too young to know this information³². This results in girls not receiving the necessary they need regarding menstruation and menstrual hygiene.

Primary sources of information

The main sources of information were adolescent girls' mothers, sisters, female family members, teachers and friends, with mothers/parents being the primary source^{11, 23, 27, 33-34, 36, 39-41, 43, 44, 46}. In a Kenyan study, teachers were the main source of information, while parents accounted for 19.4%⁴². The media was found to support certain cultural beliefs and perpetuate secrecy and shame about menstruation. The information received from family and peers includes emotional support, and tends to be more personal in nature than the information provided by schools. In contrast, it was found that girls from rural areas did not receive any information from their mothers but from other female relatives.

The educational status of mothers plays a crucial role in the knowledge conveyed about menstruation. Educated mothers are more likely to pass on accurate information to their daughters^{19, 25, 26, 31,34,35,39}. One study reported that 70, 5% of girls in urban areas were knowledgeable regarding menstruation in contrast to 53, 7% of girls in rural areas⁴⁰.

In other studies, a number of adolescent girls reported that they had little to no understanding of menstruation^{13, 21,26,33,34,40,41,45}. Many the girls required reassurance that

menstruation was a normal process¹³. Mothers of adolescent girls should be encouraged to engage in dialogue and discussion with their daughters, even though it is a sensitive topic.

A third of girls first receive information regarding menstruation from their parents and close family²⁷. It is crucial to note that by failing to learn the basics of menstruation and menstrual health, adolescent girls are at risk of unprotected sexual activity. In the abovementioned study, it was noted that Taiwan had experienced rapid development, ushering in social and political change¹⁵ and once-taboo topics such as menstruation are now being discussed more openly.

A key aspect regarding girls' experiences of menstruation is that, even though girls are prepared for and taught about the physiological aspects of this natural phenomenon, and the hygienic practices that have to be followed, emotional factors and the support that girls may need are often neglected. This absence or lack of support can lead to feelings of isolation depression, stress and anxiety^{15, 33, 36, 47}. Thus, it is important for girls not only to receive physiological support and guidance, but emotional and psychological assistance.

Mass media had an impact on the use of sanitary pads. It was a source of information regarding menstruation and increased knowledge about proper menstrual hygiene^{11, 27, 29}. There are some programmes concerning menstruation and menstrual health in Indian schools and in other developing countries²⁹. However, important information regarding fundamental areas such as 'reproductive organs, menstrual abnormalities, STDs, and contraception are not taught to adolescents in depth¹⁵. A study conducted in Bangladesh found that menstrual hygiene content and practical information about menstrual hygiene management was not taught to school going adolescent girls³⁶. This puts them at risk of unsafe sexual activity and unhealthy hygiene practices¹⁵. Adolescents who cannot communicate their experiences and concerns with their parents or teachers are at risk of receiving the incorrect information which could prove harmful in the future.

Discussion

Menarche and menstruation are natural phenomena which have a great impact on adolescent girls. The

onset of the first period is a momentous part of a young girl's development, and therefore it is crucial that sufficient attention be paid to how it is understood and managed in the early years of menstruation, while attitudes are still being formed. The role and importance of cultural perceptions are highlighted by each of the articles. Negative myths, incorrect perceptions and the isolation of girls during menstruation can have a detrimental impact on their experience and perception of menstruation. It is therefore important that these topics are discussed openly. Much attention needs to be paid to the hygiene practices that adolescents learn and follow, as these impact on their long-term reproductive and menstrual health.

The resources that adolescent girls have at their disposal may be linked to their hygiene practices. Economic status plays a fundamental role in the management of menstruation, because access to clean, running water – often lacking in poorer communities – is crucial for basic sanitation, and especially for the maintenance of hygiene during menstruation. In addition, lack of financial resources prohibits girls from being able to buy pads or tampons. Girls from poor and disadvantaged backgrounds are frequently forced to use unsanitary and unhygienic materials such as old cloths, pieces of fabric and toilet paper. These can cause damage to their reproductive organs and have lasting effects. Resources should therefore be made available for those who come from disadvantaged backgrounds and who do not have the resources to access safe and sanitary materials.

The information and preparation that adolescent girls receive when it comes to menarche and menstruation may be considered a central factor in how it is viewed and managed. Avenues for the dissemination of correct information should be made available for mothers and caregivers of girls. Accurate information equips young girls with the necessary knowledge on the biological, physiological and psychological aspects of menstruation. It also provides them with resources and avenues through which they can access materials and programmes that may assist and offer support.

Interventions aimed at increasing menstrual knowledge and menstrual hygiene management can assist in improving the menstrual experiences of girls. However, the education of populations is necessary for the effective implementation of interventions³⁸. Educational

interventions in Bangladesh for female students and menstrual hygiene programmes in Ghana have led to an increase in students' knowledge of menstruation and a decrease in school absence^{35,36}. All the above mentioned articles demonstrated that menstruation is stressful for young girls and is inadequately handled by families, communities, schools and the media. The proper information, care, support and resources should be available to young girls in all communities, so that they adapt healthy practices and balanced views of this natural occurrence. In this way, they might be in a position to break the cycle of misinformation that seems to perpetuate year after year, and in time pass on better information and support to their own daughters.

Ethical considerations

The study used secondary data. Permission to conduct the study was obtained from the relevant research committees at the relevant university, with the ethics number 15/3/29.

Conclusion

The results of this scoping review highlight the fact that poverty and perceptions/cultural beliefs influence young girls' lives when it comes to menstruation. Poverty, in particular, has a direct impact on menstrual practices and hygiene. It is clear that many girls have little or no knowledge regarding menarche and menstruation and the topic is still shrouded in secrecy and embarrassment for many girls. Mothers, friends, families, schools and the media were found to be passing on incomplete information, and emotional support was found to be mostly lacking. Thus, it is important that programmes be created within schools and communities to educate both girls and their mothers. Interestingly, in societies undergoing rapid change, such as Taiwan, it was found that attitudes toward menstruation, once a taboo topic, have become more open, resulting in better quality information being disseminated. Research must therefore be conducted in Southern Africa to investigate cultural practices and beliefs regarding menstruation, and how poverty affects the experience of menstruation young girls. Such research would reveal whether or not girls are receiving correct information and whether or not they are being encouraged to see the phenomenon as natural and normal. Further research may also reveal the extent to which poverty and cultural

Perceptions and beliefs regarding menstruation beliefs about menstruation affect school attendance and long term educational prospects.

Limitations

The number of studies was limited, and no studies were found that pertained to South Africa. This reveals a clear gap in the literature, and a need for research examining the experiences of young girls in the South African context. Several of the articles failed to provide solid definitions for the concepts such as 'menarche' and 'menstruation'. Thus, the terms may have varied in meaning among researchers, depending on their country origin and their own cultural understanding of these terms.

Acknowledgements

The study was funded by the National Research Foundation of South Africa (Grant number: 113323). The assistance of Yolanda Mayman is acknowledged.

Contribution of authors

The first author (TF) conceived, designed the study, supervised data collection for the study and prepared the manuscript, while the second- (MM) and third (AP) authors contributed to the conceptualisation and development of the study, analysed and interpreted the data. The first author wrote the first draft of the manuscript. The second and third authors critically revised subsequent drafts of the manuscript. All authors have read and approved the manuscript.

References

1. Chege FN and Arnot M. The gender–education–poverty nexus: Kenyan youth's perspective on being young, gendered and poor. *Comparative Education*. 2012;48(2):195-209. doi:10.1080/03050068.2011.608897
2. Jewitt S and Ryley H. It's a girl thing: Menstruation, school attendance, spatial mobility and wider gender inequalities in Kenya. *Geoforum*. 2014; 56:137-147. doi: 10.1016/j.geoforum.2014.07.006
3. McMahon SA, Winch PJ, Caruso BA, Obure AF, Ogutu EA, Ochari IA and Rheingans RD. 'The girl with her period is the one to hang her head' Reflections on menstrual management among schoolgirls in rural Kenya. *BioMed Central International Health and Human Rights*. 2011;11(7):1-10.
4. Mahon T and Fernandes M. Menstrual hygiene in South Asia: a neglected issue for WASH (water, sanitation

- and hygiene) programmes. *Gender & Development*. 2010;18(1): 99-113.
5. Raats C. Investigating the relationship between hope and life satisfaction among children in low and middle income communities in Cape Town. Unpublished Master Thesis. University of the Western Cape. Bellville. 2015.
6. Rembeck GI, Möller M and Gunnarsson RK. The winding road to womanhood: Adolescents' attitudes towards menstruation, womanhood and sexual health - observational and interventional studies. *Acta Paediatrica*. 2008;95(6):707-14.
7. Arksey H and O'Malley L. Scoping studies: towards a methodological framework, *International Journal of Social Research Methodology*. 2005;8(1): 19-32.
8. Smith B. Narrative analysis. *Analysing Qualitative Data in Psychology*. 2016; 2: 202-21.
9. Moher D, Liberati A, Tetzlaff J and Altman DG. The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med*. 2009;6(7):e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
10. Secor-Turner M, Schmitz K and Benson K. Adolescent Experiences of Menstruation in Rural Kenya. *Nursing Research*. 2016;65(4):301-305.
11. Gultie T, Hailu D and Workineh Y. Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in Amhara province, Ethiopia: Implication to health care workers & school teachers. *PLoS ONE*. 2014; 9(9). e108644. <https://doi.org/10.1371/journal.pone.0108644>
12. Marván ML and Molina-Abolnik MA. Mexican Adolescents' Experience of Menarche and Attitudes toward Menstruation: Role of Communication between Mothers and Daughters. *Journal of Pediatric Adolescent Gynecology*. 2012;25:358-363.
13. Wong LP. Attitudes toward menstruation, menstrual-related symptoms, and premenstrual syndrome among adolescent girls: A rural school-based survey. *Women & Health*. 2011;51(4):340-364. <https://doi.org/10.1080/03630242.2011.574792>
14. Orringer K and Gahagan S. Adolescent Girls Define Menstruation: A multiethnic exploratory study. *Health Care for Women International*. 2010;31(9):831-847. doi:10.1080/07399331003653782
15. Liu HL, Chen KH and Peng NH. Cultural Practices Relating to Menarche and Menstruation among Adolescent Girls in Taiwan - Qualitative Investigation. *Pediatric Adolescent Gynaecology*. 2012;25:43-47.
16. Shanbhag D, Shilpa R, D'Souza N, Josephine P, Singh J and Goud BR. Perceptions regarding menstruation and practices during menstrual cycles among high school going adolescent girls in resource limited settings around Bangalore city, Karnataka, India. *International Journal of Collaborative Research on Internal Medicine & Public Health*. 2012;4(7):1353-1362.
17. Thakre SB, Thakre SS, Ughade S and Thakre AD. Urban-rural differences in menstrual problems and practices Perceptions and beliefs regarding menstruation of girl students in Nagpur, India. *Indian Pediatrics*. 2012; 49(9):733-6. Epub 2012 Jun 10.
18. Behera D, Sivakami M and Behera MR. Menarche and menstruation in rural adolescent girls in Maharashtra, India. *Journal of Health Management*. 2015;17(4):510-519. doi:10.1177/0972063415612581
19. Deshpande SN, Patil SS, Gharai SB, Patil SR and Durgawale PM. Menstrual hygiene among adolescent girls – A study from urban slum area. *Journal of Family Medicine and Primary Care*. 2018;7:1439-1445. https://doi.org/10.4103/jfmpe.jfmpe_80_18
20. Amatya P, Ghimire S, Callahan KE, Baral BK and Poudel KC. Practice and lived experience of menstrual exiles (Chhaupadi) among adolescent girls in far-western Nepal. *PLOS ONE*. 2018;13(12):e0208260. <https://doi.org/10.1371/journal.pone.0208260>
21. Rastogi S, Khanna A and Mathur, P. Uncovering the challenges to menstrual health: Knowledge, attitudes and practices of adolescent girls in government schools of Delhi. *Health Education Journal*. 2019;78(7):839-850. <https://doi.org/10.1177/0017896919850209>
22. Mason L, Nyothach E, Alexander K, Odhiambo PO, Eleveld A, Vulule J, Rheingans-Laserson KF, Mohammed A and Phillips-Howar, PA. "We Keep It Secret So No One Should Know" – A Qualitative Study to Explore Young Schoolgirls Attitudes and Experiences with Menstruation in Rural Western Kenya. *PloS ONE*. 2013;8(11):1-11.
23. Marván ML and Alcalá-Herrera V. Age at menarche, reactions to menarche and attitudes towards menstruation among Mexican adolescent girls. *Journal of Pediatric and Adolescent Gynecology*. 2014;27(2):61-66. doi: 10.1016/j.jpag.2013.06.021
24. Upashe SP, Tekelab T and Mekonnen J. Assessment of knowledge and practice of menstrual hygiene among high school girls in western Ethiopia. *BMC Women's Health*. 2015;15(84):1-9. <https://doi.org/10.1186/s12905-015-0245-7>
25. Choudhary N and Gupta MK. A comparative study of perception and practices regarding menstrual hygiene among adolescent girls in urban and rural areas of Jodhpur district, Rajasthan. *Journal of Family Medicine and Primary Care*. 2019;8:875-880. <https://doi.org/10.4103/jfmpe.jfmpe6919>
26. El-Gilany AH, Badawi K and El-Fedawy S. Menstrual Hygiene among Adolescent Schoolgirls in Mansoura, Egypt. *Reproductive Health Matters*. 2005;13(26):147-152.
27. Umar L, Yusuf MW and Musa AB. Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. *African Journal of Reproductive Health*. 2010;14(3):201-207.
28. Ramathuba DU. Menstrual knowledge and practices of female adolescents in Vhembe district, Limpopo province, South Africa. *Curationis*. 2015;38(1):1-6. <https://doi.org/10.4102/curationis.v38i1.1551>
29. Chothe V, Khubchandani J, Seabert D, Asalkar M, Rakshe

- S, Firke A, Midha I and Simmons R. Students' Perceptions and Doubts about Menstruation in Developing Countries: A Case Study from India. *Health Promotion Practice*, 2014;15(3):319-326.
30. Belayneh Z and Mekuriaw B. Knowledge and menstrual hygiene practice among adolescent school girls in Southern Ethiopia: A cross-sectional study. *BMC Public Health*. 2019;19(1):1-8. <https://doi.org/10.1186/s12889-019-7973-9>
31. Borjigen A, Huang C, Liu M, Lu J, Peng H, Sapkota C and Sheng J. Status and factors of menstrual knowledge, attitudes, behaviors and their correlation with psychological stress in adolescent girls. *Journal of Pediatric and Adolescent Gynecology*. 2019;32:584-589. <https://doi.org/10.1016/j.jpog.2019.08.007>
32. Jarrah SS and Kamel AA. Attitudes and practices of school-aged girls towards menstruation. *International Journal of Nursing Practice*. 2012;18(3):308-315. <https://doi.org/10.1111/j.1440-172x.2012.02032.x>
33. Kemigisha E, Rai M, Mlahagwa W, Nyakato VN and Ivanova O. A Qualitative Study Exploring Menstruation Experiences and Practices among Adolescent Girls Living in the Nakivale Refugee Settlement, Uganda. *International Journal of Environmental Research and Public Health*. 2020;17(18):1-11.
34. Adhikari P, Kadel B, Dhungel SI and Mandal A. Knowledge and practice regarding menstrual hygiene in rural adolescent girls of Nepal. *Kathmandu University medical journal (KUMJ)*. 2007;5(3):382-386.
35. Kumbeni MT, Otupiri E and Ziba FA. Menstrual hygiene among adolescent girls in junior high schools in rural northern Ghana. *The Pan African Medical Journal*. 2020;37:1-14.
36. Alam MU, Luby SP, Halder AK, Islam K, Opel A, Shoab AK, Ghosh PK, Rahman M, Mahon T and Unicomb L. Menstrual hygiene management among Bangladeshi adolescent schoolgirls and risk factors affecting school absence: results from a cross-sectional survey. *BMJ open*. 2017;7(7):1-10.
37. Davis J, Macintyre A, Odagiri M, Suriastini W, Cordova A, Huggett C, Agius PA, Faiqoh F, Budiyan AE, Quillet C, Cronin AA, Diah NM, Triwahyunto, A, Luchters, S and Kennedy E. Menstrual hygiene management and school absenteeism among adolescent students in Indonesia: evidence from a cross-sectional school-based survey. *Tropical Medicine & International Health*. 2018;23(12):1350-63.
- Perceptions and beliefs regarding menstruation
38. Van Leeuwen C and Torondel B. Improving menstrual hygiene management in emergency contexts: literature review of current perspectives. *International journal of women's health*. 2018;10:169-186.
39. Phillips-Howard PA, Caruso B, Torondel B, Zulaika G, Sahin M and Sommer M. Menstrual hygiene management among adolescent schoolgirls in low- and middle-income countries: research priorities. *Global health action*. 2016;9(1):1-7.
40. Paria B, Bhattacharyya A and Das S. A comparative study on menstrual hygiene among urban and rural adolescent girls of West Bengal. *Journal of family medicine and primary care*. 2014;3(4):413-417.
41. Michael J, Iqbal Q, Haider S, Khalid A, Haque N, Ishaq R, Saleem F, Hassali MA and Bashaar M. Knowledge and practice of adolescent females about menstruation and menstruation hygiene visiting a public healthcare institute of Quetta, Pakistan. *BMC women's health*. 2020;20(1):1-8.
42. Korir E, Okwara FN and Okumbe G. Menstrual hygiene management practices among primary school girls from a pastoralist community in Kenya: a cross sectional survey. *Pan African Medical Journal*. 2018;31(1):1-11.
43. Ali TS and Rizvi SN. Menstrual knowledge and practices of female adolescents in urban Karachi, Pakistan. *Journal of adolescence*. 2010;33(4):531-41.
44. Gold-Watts A, Hovdenak M, Daniel M, Gandhimathi S, Sudha R and Bastien S. A qualitative study of adolescent girls' experiences of menarche and menstruation in rural Tamil Nadu, India. *International Journal of Qualitative Studies on Health and Well-being*. 2020;15(1):1-14.
45. Hennegan J and Sol L. Confidence to manage menstruation at home and at school: findings from a cross-sectional survey of schoolgirls in rural Bangladesh. *Culture, health & sexuality*. 2020;22(2):146-65.
46. Andani PR. Knowledge, Attitude and Practice of Menstrual Hygiene among Primary School Adolescents in Surabaya, Indonesia. *Indian Journal of Forensic Medicine & Toxicology*. 2020;14(3):1109-1114.
47. Guehi EZ and Secredou KM. The Experience of Menstruation at School: A Study with High School Girls in the Northern Côte D'Ivoire. *Collegium Antropologicum*. 2019; 43(3):183-190.
48. Oliver KL. A journey into narrative analysis: A methodology for discovering meanings. *Journal of Teaching in Physical Education*. 1998;17(2): 244-59.